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S&H Form: (02/05)

REPLY/AMENDMENT FEE TRANSMITTAL	Attorney Docket No.	1293.1318
	Application Number	10/076,075
	Filing Date	February 15, 2002
	First Named Inventor	Bong-gi KIM
	Group Art Unit	2627
AMOUNT ENCLOSED 620.00	Examiner Name	Peter Vincent AGUSTIN

FEE CALCULATION (fees effective 12/08/04)

CLAIMS AS AMENDED	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra	Rate	Calculations
TOTAL CLAIMS		- =	0	X $ 50.00 =	$ 0.00
INDEPENDENT CLAIMS		- =	0	X $ 200.00 =	0.00
Since an Official Action set an original due date of January 27, 2007, petition is hereby made for an extension to cover the date this reply is filed for which the requisite fee is enclosed (1 month ($120)); (2 months ($450)); (3 months ($1,020)); (4 months ($1,590)); (5 months ($2,160):					120.00
If Appeal Brief is enclosed, add ($500.00)					500.00
If Statutory Disclaimer under Rule 20(d) is enclosed, add fee ($130.00)					
Information Disclosure Statement (Rule 1.17(p)) ($180.00)					
Total of above Calculations =					$ 620.00
Reduction by 50% for filing by small entity (37 CFR 1.9, 1.27 & 1.28)					
TOTAL FEES DUE =					$ 620.00

(1) If entry (1) is less than entry (2), entry (3) is "0".
(2) If entry (2) is less than 20, change entry (2) to "20".
(4) If entry (4) is less than entry (5), entry (6) is "0".
(5) If entry (5) is less than 3, change entry (5) to "3".

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SUBMITTED BY: STAAS & HALSEY LLP

Typed Name	Paul F. Daebeler	Reg. No.	35,852
Signature	Paul F. Daebeler	Date	February 27, 2007

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Docket No. 1293.1318

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	:	
Bong-gi KIM	:	
Serial No. 10/076,075	:	Group Art Unit: 2627
Filed: February 15, 2002	:	Examiner: Peter Vincent Agustin

For: APPARATUS AND METHOD OF COMPENSATING FOR DEVIATION BETWEEN OPTICAL AXES

APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

Mail Stop: Appeal Brief-Patents

Sir:

In a Notice of Appeal filed November 27, 2006, the Applicant appealed the Examiner's July 25, 2006 Office Action finally rejecting claims 1, 3-15, 17, and 18. Therefore, Appellant's Brief is due January 29, 2007 (January 27, 2007 being a Saturday and January 28, 2007 being a Sunday). A petition for a one-month extension of time together with the requisite fee is concurrently filed herewith, thereby extending the due date to February 27, 2007.

Appellant's Brief, together with the requisite fee set forth in 37 C.F.R. § 41.20(b)(2), is submitted herewith.

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01 FC:1251 120.00 OP
02 FC:1402 500.00 OP

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I. Real Party in Interest

The real party in interest in this Appeal is Samsung Electronics Co., Ltd., the assignee of the subject application.

II. Related Appeals and Interferences

Appellant, Appellant's legal representatives, and the assignee are not aware of any other patent applications, patents, appeals, interferences, or judicial proceedings, which may be related to, directly affect or be directly affected by, or have a bearing on the Board's decision in the pending Appeal.

III. Status of Claims

Appealed claims 1, 3-15, 17, and 18 have been rejected. These are the only pending claims in the subject application. Claims 2 and 16 have been cancelled without prejudice or disclaimer. Claims 1, 3-15, 17, and 18 are being appealed.

IV. Status of Amendments

Appellant's Amendment (Request for Reconsideration) filed October 24, 2006 was considered, but the Appellant's Amendment (Request for Reconsideration) filed October 24, 2006 did not place the application in condition for allowance as indicated by item 11 of the Advisory Action mailed November 7, 2006. No claim amendments were made after the final rejection of claims 1, 3-15, 17, and 18 in the Final Office Action mailed on July 25, 2006.

V. Summary of Claimed Subject Matter

The present invention relates to an optical pickup apparatus (Figure 2) having a beam splitter (35) on which a hologram (33) is formed and a method for compensating for deviation between optical axes using the optical pickup apparatus having the beam splitter (35).

Independent Claim 1

With respect to independent claim 1, a first light source 53 and a second light source 55 are discussed in paragraph [0027] of the specification. Figure 2 shows a first light source 53 to generate a first light beam and a second light source 55 to generate a second light beam whose optical axis is in parallel with the optical axis of the first light beam. As described in paragraph [0027] of the specification and shown in Figure 2, the second light source (55) is disposed optically further from a recording medium (45) than the first light source (53).

Figure 2 shows a photodetector (39) receiving the first light beam and the second light beam which are emitted from the first and second light sources and which are reflected from the recording medium (45). The photodetector (39) performs photoelectric conversion as discussed in paragraph [0033], lines 4 and 5 of the specification.

As discussed in paragraph [0032], lines 1 through 3 of the specification and shown in Figure 2, an objective lens (43) focuses the first light beam and the second light beam on the recording medium (45). As shown in Figure 2, objective lens 43 is disposed on an optical path between the first and second light sources (53, 55) and the recording medium (45).

Figure 2 shows a beam splitter (35) disposed on an optical path between an objective lens (43) and a photodetector (39). A first surface (31) of the beam splitter (35) reflects the first and second light beams and simultaneously transmits the first light beam and the second light beam as shown in Figure 2 and described in paragraph [0029], lines 1 through 3 of the specification. The beam splitter (35) also has a second surface (33) on which a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface as discussed in paragraph [0029], lines 3 and 4, and paragraph [0034], lines 1 through 3 of the specification.

The hologram is formed to diffract the first light beam into a relatively more +1-order diffracted light beam and relatively less residual light, and to diffract the second light beam into a

relatively more zero-order diffracted light beam and relatively less residual light as described in paragraph [0035] of the specification.

As shown in Figure 2, the optical axis of the light beam is parallel to the optical axis of the second light beam before the first and second light beams are reflected by the beam splitter (35) and after the first and second light beams are reflected by the beam splitter (35).

Independent Claim 10

With respect to independent claim 10, Figures 2 and 3 show a method of compensating for a deviation between optical axes of light sources (53 and 55). Paragraph [0034] of the specification discloses applying a voltage to one of the light sources (53 and 55) to cause a light beam to be emitted (Figure 2), wherein the optical axis of one light source (53) is in parallel with the optical axis of the other light source (55). Paragraph [0034] further discloses allowing the emitted light beam (emitted from light source 53 or light source 55) to be reflected from a first surface (31) of a beam splitter (35), transmitted through an objective lens (43), focused on a recording medium (45), and reflected from the recording medium (45). Paragraph [0034] further discloses allowing the light beam (emitted from light source 53 or 55) reflected from the recording medium (45) to be incident on a second surface (33) of the beam splitter (35).

Figures 2 and 3 show and paragraph [0035] of the specification discloses diffracting the light beam (emitted from light source 53 or 55) which is incident on the second surface (33) of the beam splitter (35) into a relatively more +1-order diffracted light beam and relatively less residual light when the light source emitting the light beam is optically closer to the recording medium (45) than the other light source, and diffracting the light beam which is incident on the second surface (33) of the beam splitter (35) into a relatively more zero-order diffracted light beam and relatively less residual light when the light source emitting the light beam is optically farther from the recording medium (45) than the other light source

Figures 2 and 3 show and paragraph [0035], lines 9-11 of the specification discloses focusing the zero-order diffracted light beam or the +1-order diffracted light beam transmitted through the second surface (33) on a photodetector (39).

As shown in Figure 2, the optical axis of the emitted light beam is parallel to the optical axis of a second light beam from the other light source (53 or 55) before the emitted light beam and the second light beam are reflected by the beam splitter (35) and after the emitted light beam and second light beam are reflected by the beam splitter (35).

Figures 2 and 3 show a hologram formed on the second surface (33) to compensate for a deviation between optical axes of the emitted light beam and the second light beam, which are transmitted through the first surface (31) as discussed in paragraphs [0029], [0034], and [0035] of the specification

Independent Claim 15

With respect to independent claim 15, a first light source 53 and a second light source 55 are discussed in paragraph [0027] of the specification. Figure 2 shows a first light source 53 to generate a first light beam and a second light source 55 to generate a second light beam whose optical axis is in parallel with the optical axis of the first light beam. As described in paragraph [0027] of the specification and shown in Figure 2, the second light source (55) is disposed optically further from a recording medium (45) than the first light source (53).

Figure 2 shows a photodetector (39) receiving the first light beam and the second light beam which are emitted from the first and second light sources and which are reflected from the recording medium (45). The photodetector (39) performs photoelectric conversion as discussed in paragraph [0033], lines 4 and 5.

As discussed in paragraph [0032], lines 1 through 3 and shown in Figure 2, an objective lens (43) focuses the first light beam and the second light beam on the recording medium (45). As shown in Figure 2, objective lens 43 is disposed on an optical path between the first and second light sources (53, 55) and the recording medium (45).

Figure 2 shows a beam splitter (35) disposed on an optical path between an objective lens (43) and a photodetector (39). A first surface (31) of the beam splitter (35) reflects the first light beam and second light beam towards the objective lens (43) as shown in Figure 2 and described in paragraph [0029], lines 1 through 3 of the specification. The beam splitter (35) also has a second surface (33), which compensates for a deviation between optical axes of the first and second light beams transmitted through the first surface as discussed in paragraph [0029], lines 3 and 4, and paragraph [0034], lines 1 through 3 of the specification.

The hologram is formed on a second surface (33) to diffract the first light beam into a relatively more +1-order diffracted light beam and relatively less residual light, and to diffract the second light beam into a relatively more zero-order diffracted light beam and relatively less residual light as described in paragraph [0035] of the specification.

As shown in Figure 2, the optical axis of the light beam is parallel to the optical axis of the second light beam before the first and second light beams are reflected by the beam splitter (35) and after the first and second light beams are reflected by the beam splitter (35).

VI. Grounds of Rejection to be Reviewed on Appeal

The rejection of claims 1, 3-15, 17, and 18 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,392,977 issued to Ando et al. (hereinafter referred to as "Ando") in view of U.S. Patent No. 5,659,531 issued to Ono et al. (hereinafter referred to as "Ono") and the admitted prior art is to be reviewed on appeal. The admitted prior art includes Figure 1 and paragraphs [0003] through [0009] of the specification.

VII. Argument

A. <u>U.S. Patent No. 6,392,977 (Ando)</u>

Ando discloses an optical pickup device and the recording and/or reproducing apparatus for selectively recording and/or reproducing information signals for first and second optical discs of different recording densities using two light beams having different wavelengths (col. 1, lines 10-15). More specifically, Figure 1 of Ando discloses an optical pickup device 1 enabling information signals to be selectively recorded or reproduced on a first optical disc 2a or a second optical disc 2b having different recording densities using a first light beam of approximately 780 nm and a second light beam of 410 nm (col. 4, lines 15-35).

As shown in Figure 1, a first semiconductor laser 3a emits a first light beam L1 having a wavelength of 780 nm and a second semiconductor laser 3b emits a second light beam L2 having a wavelength of 410 nm (col. 4, lines 15-65). A dichoric beam splitter 4 is positioned at a crossing point between the optical axes of the first light beam L1 and the second light beam L2. The dichoric beam splitter 4 has a light polarizing film 4a on a surface included at 45 degrees relative to the optical axis of first light beam L1. The light polarizing film has a light reflectance of approximately 100% to the first light beam L1 (which reflects approximately 100% of the first light beam by 90 degrees) and has a light transmittance of approximately 100% to the second light beam L2. Thus, the dichoric beam splitter 4 provides coincident light paths for the first light beam L1 and the second light beam L2 (col. 5, lines 22-35).

Subsequently, a beam splitter 7 receives the first and second light beams L1 and L2, which have been collimated by the collimator lens 6. The beam splitter 7 has a light polarizing film 7a on a plane inclined by 45 degrees relative to the optical axes of the first and second light beams L1 and L2. The light polarizing film 7a transmits the first and second light beams L1 and L2, so that the light beams L1 and L2 fall on the objective lens 9, while deflecting the first and second light beams L1 and L2 reflected back from the first optical disc 2a or the second optical disc 2b and returned from the dichoric hologram 8 by 90 degrees towards the photodetector 15 (col. 5, line 66 through col. 6, line19).

The dichoric hologram 8 has wavelength selectivity and limits the aperature of the first light beam L1 from the beam splitter 7 to correct spherical aberration. Specifically, the dichoric hologram 8 is a hologram element transmitting not less than 90% of the diffracted light of the 0^{th}

order light of the second light beam L2 and not more than a few percent of the other diffracted light, while transmitting not less than 70% of the diffracted light of the first order light of the first light beam L1 and not more than a few percent of the other diffracted light. The diffraction grating pattern of a hologram element constituting the dichoric hologram 8 is shaped such as to correct the spherical aberration produced due to the thickness of the substrate of the first optical disc 2a being larger than the thickness of the substrate of the second optical disc 2b on illuminating the first light beam L1 on the signal recording surface of the first optical disc 2a. The diffraction grating pattern of the hologram element constituting the dichoric hologram 8 is formed for a range such that the diffraction grating pattern will be smaller than the aperature when the second light beam L2 is illuminated on the second optical disc 2b so that the numerical aperature of the objective lens 9 will be optimum when the first light beam L1 is illuminated on the first optical disc 2a (col. 6, lines 20-42).

The objective lens 9 is arranged facing the signal recording surface of the first optical disc 2a or that of the second optical disc 2b, and operates for converging the first and second light beams L1 and L2 from the dichoric hologram 8 for illumination on the signal recording surface of the first optical disc 2a or the second optical disc 2b (col. 6, lines 43-48).

B. <u>U.S. Patent 5,659,531 (Ono)</u>

Ono discloses a birefringement diffraction grating polarizer, a polarizing hologram element, and an optical head device using the polarizer or hologram element. As indicated in the Abstract, Ono's device includes a polarizing hologram element, which reflects the light from a light source to a converging lens system and diffracts the polarized light returning from a recording medium. A polarizing beam splitter film formed on a surface of the polarizing hologram element has reflectivity and transmissivity having dependency on the polarization of the incident light. In another form, a polarizing hologram element includes a polarizing hologram which has diffractive efficiency having dependency on polarization of incident light and a polarizing beam splitter film which has reflectivity and transmissivity having dependency on the polarization of the incident light.

Figure 11A of Ono shows a schematically exploded view of the optical head device, which is used in a video disk, a write once read many type optical disk and a rewritable type phase-change optical disk. Column 7, lines 35-61 describes the optical head device shown in

Figure 11A. The optical head device shown in Figure 11A includes a hologram element 216. The back surface of hologram element 216 constitutes a birefringement diffraction grating polarizer of a reflection type.

Light from a semiconductor laser 210 is incident on the hologram element 216 where the light is in such polarization state that it is reflected without being diffracted at the grating layer therein. The reflected beams are collimated by a collimating lens 211 and are converged on an optical disk 214 after passing through a ¼ wavelength plate 213 and an objective lens 212. The beams reflected at the optical disk 214 return through the common path and are again incident on the hologram element 216. The polarization direction of the reflected light is rotated 90 degrees from that of the original light after passing forwardly and rearwardly through the ¼ wavelength plate 213, so that the light is diffracted at the hologram element 216 and the diffracted beams are received by a first photodetector 230 and a second photodetector 231, respectively.

C. Admitted Prior Art

Digital versatile disc (DVD) players reproduce data recorded on DVDs and reproduce data recorded on compact discs (CDs). To decrease the number of parts used to manufacture DVD players, a dual wavelength laser diode is manufactured to include both (1) a laser diode for reproducing data recorded on DVDs by emitting light having a wavelength of 650 nanometers (nm) to read data from DVDs and (2) a laser diode for reproducing data recorded on CDs by emitting light having a wavelength of 780 nanometers (nm) to read data from CDs.

In a conventional pickup apparatus, when a photodetector and the other optical devices are arranged on the optical axis of a first light beam emitted from a first laser diode, a second light beam emitted from a second laser diode having a different optical axis cannot form a focal point on the photodetector. Figure 1 is a diagram of a conventional optical pickup apparatus using a holographic optical element (HOE) 20 positioned on an optical path between a beam splitter 19 and a photodetector 29 to correct a first light beam 13a having a wavelength and a second light beam 15a having a different wavelength. The first light beam 13a and the second light beam 15a are emitted from a dual wavelength light source 11 and reflected from a recording medium 25.

The conventional pickup apparatus compensates for a deviation between the optical axis of the first light beam 13a and the optical axis of the second light beam 15a by properly

diffracting the first light beam 13a and the second light beam 15a using the holographic optical element 20, which focuses the first light beam 13a and the second light beam 15a at a predetermined focal point on the photodetector 29.

Although adding a holographic optical element 20 solves the problem of forming a proper focal point for both the first light beam 13a and the second light beam 15a, the addition of a holographic optical element 20 increases the complexity and cost of manufacturing an optical pickup apparatus. In addition, in the case where the inside of the optical pickup apparatus is heated to a high temperature during operation of the optical pickup apparatus, positions where individual parts bond to each other may change due to melting of glue, resulting in optical aberration of light incident on a photodetector instead of properly focusing the light on a predetermined focal point.

D. <u>Claims 1, 3-15, 17, and 18</u>

In item 3 of the Office Action mailed July 25, 2006, the Office Action appears to assert that Ando teaches all of the features of claim 1 except for the following:

> "(a)... the hologram is formed on a second surface of the beam splitter (note that Ando et al.'s hologram is <u>separately provided</u> from the beam splitter, and not formed on any surface of the beam splitter), and
> (b)... the optical axis of the first light beam is parallel to the optical axis of the second light beam before the first and second light beams are reflected by the beam splitter and after the first and second light beams are reflected by the beam splitter."

Item 3 of the Office Action mailed July 25, 2006 further asserts that (1) Ono's hologram element 216 shown in Figure 11A of Ono discloses item (a) and that (2) light source 11 having first light source 13 and second light source 15 of the admitted prior art Figure 1 of the present application discloses item (b).

Although Applicant agrees that Ando does <u>not</u> disclose items (a) and (b), Applicant respectfully submits that Ono and the admitted prior art do <u>not</u> cure the deficiencies of (a) and (b). In addition, Applicant respectfully submits that Ando and Ono do <u>not</u> cure additional deficiencies of Ando.

Applicant respectfully submits that Ando, Ono, and the admitted prior art, taken separately or in combination, do not disclose, teach, or suggest at least,

> "a beam splitter disposed on an optical path between the objective lens and the photodetector, the beam splitter having a first surface to reflect the first light beam and the second light beam toward the objective lens and simultaneously transmitting the first light beam and the second light beam, and a second surface on which a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface," as recited in claim 1.

As noted in the Office Action, Ando does not disclose, "the beam splitter having...a second surface on which a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface," as recited in claim 1. Ando does not disclose a beam splitter on which a hologram is formed. Instead, Figure 1 of Ando shows a beam splitter 7 separated from a dichoric hologram 8.

Figure 1 of the admitted prior art also shows beam splitter 19 separated from holographic optical element 20.

With respect to Ono, Ono discloses a hologram element 216, which is formed for diffracting beams reflected from an optical disk 214. More specifically, light from a semiconductor laser 210 is incident on the hologram element 216 where the light... is reflected without being diffracted at the grating layer therein. The reflected beams ... are converged on the optical disk 214. The beams reflected at the optical disk 214 return through the common path and are again incident on the hologram element 216....the light is diffracted at the hologram element 216 and the diffracted beams are received by a first photodetector 230 and a second photodetector 231, respectively (col. 7, lines 35 through 61 of Ono).

Ono does not disclose, teach, or suggest, "a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface." Accordingly, even if Ono was combined with Ando and the admitted prior art, the combination of cited references does not disclose, teach, or suggest, "a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface."

In response to this argument, item 4 of the Office Action mailed July 25, 2006 and item (a) of the Advisory Action mailed November 7, 2006 assert that Ando is relied upon to teach a compensation for deviation between the first and second optical axes of the first and second

light beams transmitted through the first surface. The Office Action and Advisory Action both assert that Applicant is attacking the references individually instead of the references taken in combination. Applicant respectfully traverses this assertion.

Applicant claims “the beam splitter having…a second surface on which a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface,” as recited in claim 1. Neither Ando nor Ono shows a beam splitter capable of forming a hologram to compensate for a deviation between optical axes of the first and second light beams. Neither Ando nor Ono shows the beam splitter 35 shown in Figure 2 of the present application. Ando's beam splitter 7 does not form a hologram and Ono's hologram element 216 does not compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface.

Accordingly, even if Ono's hologram element 216 was substituted for beam splitter 7 and dichoric hologram 8 in Ando, the combination of Ando and Ono does not provide, “beam splitter having…a second surface on which a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface,” as recited in claim 1. Ando and Ono do not disclose, teach, or suggest the structure of the new beam splitter, which is recited in the claim 1.

In addition, Applicant respectfully submits that one having ordinary skill in the art would not have been motivated to combine the cited references. As discussed above, Ono's hologram element 216 does not compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface. However, Ando requires a dichoric hologram 8 to correct spherical aberration produced due to the substrate thickness of optical disc 2a being larger than the substrate thickness of optical disc 2b. Figure 11A and column 7, lines 35-61 of Ono do not even recognize this problem. Instead, only one disc 214 is shown in Figure 11A. Therefore, one having ordinary skill in the art at the time of the invention would not have been motivated to combine Ono's hologram element 216 with Ando, because Ono's hologram element 216 does not correct spherical aberration produced due to the substrate thickness of optical disc 2a being larger than the substrate thickness of optical disc 2b. Accordingly, Ono's hologram element 216 cannot be used to achieve the objectives set out in col. 2, lines 35-40 of Ando, which is to provide an optical pickup device for optical discs with different recording densities. Accordingly, one having ordinary skill in the art would not have been motivated to combine these references.

Therefore, for at least these reasons, claim 1 is patentably distinguishable from the cited references.

Claims 3 through 9 and 18 depend from claim 1 and include all of the features of claim 1. Therefore, for at least these reasons, claims 3 through 9 and 18 are also patentably distinguishable over the cited references.

Similarly, Applicant respectfully submits that Ando, Ono, and the admitted prior art, taken separately or in combination, do not disclose, teach, or suggest at least,

> "allowing the emitted light beam to be reflected from a first surface of a beam splitter, transmitted through an objective lens, focused on a recording medium, and reflected from the recording medium; allowing the light beam reflected from the recording medium to be incident on a second surface of the beam splitter;...wherein a hologram is formed on the second surface to compensate for a deviation between optical axes of the emitted light beam and the second light beam, which are transmitted through the first surface," as recited in claim 10.

Therefore, for at least these reasons, claim 10 is patentably distinguishable from the cited references.

Claims 11 through 14 depend from claim 10 and include all of the features of claim 10. Therefore, for at least these reasons, claims 11 through 14 are also patentably distinguishable over the cited references.

Also similarly, Applicant respectfully submits that Ando, Ono, and the admitted prior art, taken separately or in combination, do not disclose, teach, or suggest at least,

> "a beam splitter disposed on an optical path between the objective lens and the photodetector, the beam splitter having a first surface to reflect the first light beam and the second light beam toward the objective lens, and a second surface which receives the first and second light beams reflected from the recording medium, to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface, wherein the second surface is a hologram...," as recited in claim 15.

Therefore, for at least these reasons, claim 15 is patentably distinguishable from the cited references.

references.

Claim 17 depends from claim 15 and includes all of the features of claim 15. Therefore, for at least these reasons, claim 17 is also patentably distinguishable over the cited references

E. Conclusion

As discussed above, Applicant respectfully submits that claims 1, 3-15, 17, and 18 are patentably distinguishable from the cited references. Accordingly, withdrawal of the rejection of claims 1, 3-15, 17, and 18 under 35 U.S.C. §103(a) is respectfully requested.

The Commissioner is authorized to charge any Appeal Brief fee or Petition for Extension of Time fee for underpayment, or credit any overpayment, to Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: February 27, 2007

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VIII. Claims Appendix

1. An optical pickup apparatus comprising:

a first light source to generate a first light beam;

a second light source to generate a second light beam whose optical axis is parallel to the optical axis of the first light beam, the second light source being disposed optically farther from a recording medium than the first light source;

a photodetector to receive the first light beam and the second light beam which are emitted from the first and second light sources, respectively, and which are reflected from the recording medium and performing photoelectric conversion;

an objective lens to focus the first light beam and second light beam on the recording medium, the objective lens being disposed on an optical path between the first and second light sources and the recording medium; and

a beam splitter disposed on an optical path between the objective lens and the photodetector, the beam splitter having a first surface to reflect the first light beam and the second light beam toward the objective lens and simultaneously transmitting the first light beam and the second light beam, and a second surface on which a hologram is formed to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface,

wherein the hologram is formed to diffract the first light beam into a relatively more +1-order diffracted light beam and relatively less residual light, and to diffract the second light beam into a relatively more zero-order diffracted light beam and relatively less residual light, and

wherein the optical axis of the first light beam is parallel to the optical axis of the second light beam before the first and second light beams are reflected by the beam splitter and after the first and second light beams are reflected by the beam splitter.

3. The optical pickup apparatus according to claim 1, wherein the first surface is set such that the first light beam and the second light beam are incident thereon at an angle of 45°.

4. The optical pickup apparatus according to claim 3, further comprising a coating formed on the first surface so that approximately 50% of the first light beam is reflected and approximately 50% thereof is transmitted.

5. The optical pickup apparatus according to claim 3, further comprising a coating formed on the first surface so that approximately 50% of the second light beam is reflected and approximately 50% thereof is transmitted.

6. The optical pickup apparatus according to claim 3, wherein the hologram is formed such that the +1-order diffracted light beam is at least 70% as much as the first light beam.

7. The optical pickup apparatus according to claim 3, wherein the hologram is formed such that the zero-order diffracted light beam is at least 70% as much as the second light beam.

8. The optical pickup apparatus according to claim 1, further comprising a collimating lens on an optical path between the beam splitter and the objective lens.

9. The optical pickup apparatus according to claim 1, further comprising a concave lens on an optical path between the beam splitter and the photodetector.

10. A method of compensating for a deviation between optical axes of light sources, the method comprising:

applying a voltage to one of the light sources to cause a light beam to be emitted, wherein the optical axis of one light source is in parallel with the optical axis of the other light source;

allowing the emitted light beam to be reflected from a first surface of a beam splitter, transmitted through an objective lens, focused on a recording medium, and reflected from the recording medium;

allowing the light beam reflected from the recording medium to be incident on a second surface of the beam splitter;

diffracting the light beam which is incident on the second surface of the beam splitter into a relatively more +1-order diffracted light beam and relatively less residual light when the light source emitting the light beam is optically closer to the recording medium than the other light source, and diffracting the light beam which is incident on the second surface of the beam splitter into a relatively more zero-order diffracted light beam and relatively less residual light when the light source emitting the light beam is optically farther from the recording medium than the other light source; and

focusing the zero-order diffracted light beam or the +1-order diffracted light beam transmitted through the second surface on a photodetector,

wherein the optical axis of the emitted light beam is parallel to the optical axis of a second light beam from the other light source before the emitted light beam and the second light beam are reflected by the beam splitter and after the emitted light beam and second light beam are reflected by the beam splitter, and

wherein a hologram is formed on the second surface to compensate for a deviation between optical axes of the emitted light beam and the second light beam, which are transmitted through the first surface.

11. The method according to claim 10, wherein in the allowing the emitted light beam to be reflected, the light beam emitted from the light source is incident on the first surface of the beam splitter at an angle of 45°.

12. The method according to claim 10, wherein in the allowing the emitted light beam to be reflected, 50% of the light beam is substantially reflected from the first surface of the beam splitter.

13. The method according to claim 10, wherein in the diffracting, the zero-order diffracted light beam is at least 70% as much as the emitted light beam.

14. The method according to claim 10, wherein in the diffracting, the +1-order diffracted light beam is at least 70% as much as the emitted light beam.

15. An optical pickup apparatus comprising:

a first light source to generate a first light beam;

a second light source to generate a second light beam whose optical axis is parallel to the optical axis of the first light beam, the second light source being disposed optically farther from a recording medium than the first light source;

a photodetector to receive the first light beam and the second light beam which are emitted from the first and second light sources, respectively, and which are reflected from the recording medium and performing photoelectric conversion;

an objective lens to focus the first light beam and second light beam on the recording medium, the objective lens being disposed on an optical path between the first and second light sources and the recording medium; and

a beam splitter disposed on an optical path between the objective lens and the photodetector, the beam splitter having a first surface to reflect the first light beam and the second light beam toward the objective lens, and a second surface which receives the first and second light beams reflected from the recording medium, to compensate for a deviation between optical axes of the first and second light beams transmitted through the first surface,

wherein the second surface is a hologram, which is formed to diffract the first light beam into a relatively more +1-order diffracted light beam and relatively less residual light, and to diffract the second light beam into a relatively more zero-order diffracted light beam and relatively less residual light, and

wherein the optical axis of the first light beam is parallel to the optical axis of the second light beam before the first and second light beams are reflected by the beam splitter and after the first and second light beams are reflected by the beam splitter.

17. The optical pickup apparatus according to claim 15, further comprising a coating formed on the first surface so that a portion of the first and second light beams is reflected and the remaining portion of the first and second light beams is transmitted.

18. The optical pickup apparatus according to claim 3, wherein a coating is formed on the first surface so that approximately 50% of the second light beam is reflected and approximately 50% thereof is transmitted.

IX. Evidence Appendix

None

X. Related Proceedings Appendix

None